

# **Impact and Influence of Trees for Canterbury on the Community**

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## **Executive Summary**

Our project collaborated with Trees for Canterbury (TFC); a not-for-profit organisation (NFP) dedicated to planting native trees. Our objective was to assess TFC's community impact and identify areas for enhancement to boost outreach, amplify influence, and ensure long-term sustainability. Our research sought to answer the question, "How does Trees for Canterbury impact the people/communities they collaborate with, and what can they do better?" We hypothesised that the organisation's impact would be positive, leading to an increase in pro-environmental views and behaviours within the community.

Our literature review emphasised the benefits of volunteering and nature engagement, the multifaceted approach required for sustainability, and the pivotal role of NFPs in environmental conservation. Employing surveys and interviews, our study revealed robust community support and contentment with TFC. Participants frequently reported heightened well-being, knowledge, and eco-friendly behaviours. Suggestions for improvement included bolstering social media presence, adjusting planting schedules, and expanding education efforts.

These findings underscore TFC's positive influence on the community and suggest opportunities for growth, particularly among younger demographics. Overall, TFC's mission of employing, educating, and regenerating the environment aligns well with the community's needs and expectations, which will allow TFC to continue to succeed well into the future.

The study suggests several areas for TFC's future development, including targeted advertising to engage younger demographics and conducting long-term impact assessments to measure the effectiveness of their educational programs.

In conclusion, TFC is effectively fulfilling its mission of educating, employing, and regenerating the environment, as validated by the research findings. The study provides actionable recommendations for TFC's continued growth and success.

## **1. Introduction**

Environmental preservation, alongside the sustainable practices that bolster it, are prominent topics on the agendas of international governments. It has never been more vital for the community to protect the earth and encourage healthy practices. Globally, individuals are increasingly becoming aware of climate change and are starting personal attempts to mitigate it (Uyeh et al., 2021).

In the middle of this global environmental movement, some groups have stepped up as conservation leaders and are playing central roles in their areas. Trees for Canterbury (TFC) is one such organisation. TFC is a not-for-profit (NFP) organisation which has been running for over 25 years to produce native plants for independent and community planting (Trees for Canterbury, 2019). They have established a considerable presence in Canterbury, becoming leaders in environmental rehabilitation with their environmental activism, paired with actions such as tree planting and community participation (Trees for Canterbury, 2019).

"Employ, educate, regenerate" are TFC's aims. Their philosophy of inclusive employment supports individuals with disabilities and impairments and at-risk youth by involving them in the community. Through education, they raise environmental awareness, aiming for the regeneration of the environment in Canterbury using native plants. TFC ties together caring for the environment, involvement in the community, and inclusion to create a better future (Trees for Canterbury, 2019).

The primary research question guiding our investigation is: "How does Trees for Canterbury impact the people/communities they collaborate with, and what can they do better?" This inquiry holds significant importance as it encompasses not only the apparent results of the collective effort but also the impacts on the well-being of individuals and their understanding of the environment. This study has two main goals: to find out how widely and effectively tree planting efforts work in Canterbury and to evaluate how TFC affects the health and well-being of their employees and volunteers. This issue is important in many ways, as community-driven projects frequently serve as the foundation for long-term practices. Therefore, it is critical to ascertain the community's feelings and degree of engagement.

The significance of this research extends beyond TFC. It is vital to find out how well environmental efforts are working and their level of engagement with the community as climate change worsens. In Canterbury, community-led projects are becoming crucial for issues such as habitat loss, coastal erosion, and flooding (Macara et al., 2020). Efforts led by groups like TFC make it possible for the community to be involved in sustainable methods to mitigate the effects of climate change. To enhance the magnitude of these endeavours, it is necessary to systematically document individuals' statements, corresponding sentiments, and their level of engagement. By understanding the community's perceptions, beliefs, and expectations, we aim to provide actionable insights that guide the organisation's future strategies and initiatives.

This report, through its structured approach, aims to provide that feedback. The literature review will ground our research in existing academic knowledge, ensuring that our findings and recommendations are novel and rooted in established principles. The method section details the techniques and methods used to collect and analyse data. The results of our study will provide information about how the community feels, how involved they are, and what they think could be done better. In the discussion, we aim to contextualise these findings by identifying commonalities with existing knowledge and highlighting novel concepts. Finally, our suggestions will help TFC deduce how to move forward so they can continue to benefit the community and the environment.

## **2. Literature Review**

In recent years, the issue of climate change has come to the forefront of the minds of many people, organisations, and the media (Brierley, 2022). With this has come the desire for many individuals to help make a positive impact. Many organisations, especially NFPs, have been formed and many of their volunteers are these sorts of people. In Canterbury, with the rise of school strikes for climate and education surrounding environmental issues, NFPs such as TFC have been able to act quicker as the number of actively involved members increases.

### ***2.1. Ecological Importance of Tree Planting***

Trees play a vital role in soil health, combating erosion and desertification (Hughes, 2016). Some tree species, like kānuka (*Kunzea ericoides*), excel in phytoremediation, absorbing contaminants

such as zinc and copper (Hahner et al., 2014). Appropriate tree planting techniques, tailored to local climate and vegetation, are essential (Cao, 2008).

Trees provide valuable water management benefits, reducing stormwater runoff, controlling erosion, and improving water quality (Collier et al., 1995). Careful selection of tree species considering root characteristics and shading effects helps maintain ground cover vegetation, prevent erosion, and reduce sedimentation (Smith, 1992).

Trees also contribute significantly to carbon sequestration, with larger, denser trees, especially newly planted ones, offering higher carbon sequestration potential (Carswell et al., 2009). To optimize carbon sequestration, safeguarding planted species is crucial, along with practices like using high-quality soils, mulching to inhibit weed growth, and reducing evaporation around the base of the tree (Chalker, 2007).

Strategically planting a diverse range of tree species is essential for biodiversity conservation, sustaining various insects and birds, facilitating seed dispersal, and broadening the scope of native tree projects (Clout & Hay, 1989). Urban native plantings create ecological refuges and bolster ecosystems against disturbances, offering multifaceted benefits (Côté & Darling, 2010; Nguyen et al., 2021). In Canterbury, habitat fragmentation poses challenges, leading to the reproductive isolation of birds and species. However, creating corridors of native vegetation can connect these communities and increase species survival rates (Canterbury et al., 2000).

## ***2.2. Psychological Benefits of the Environment***

The natural environment is a vital resource and a refuge for many, yet the direct effects of nature on our mental and physical well-being remain largely unexplored. Research suggests that spending time in natural settings has a significant impact on individuals. This relationship is complex and multifaceted, as it positively affects various aspects of personal well-being, including happiness, life satisfaction, self-esteem, sense of control over life, physical health, and depression (O'Brien et al., 2010; Thoits & Hewitt, 2001; Arnold et al., 2021). Volunteering, particularly in natural settings, brings people together, fosters social networks, and positively impacts human well-being (Kulik, 2018; Kulik, 2019). These benefits extend to individuals with

disabilities and impairments, but insufficient support hinders their involvement in volunteering (Balandin et al., 2006; Shandra, 2017). Access to resources is a key facilitator in increasing volunteering rates among this population (Kulik, 2019).

### ***2.3. Role of NFPs in Environmental Conservation***

NFPs play a pivotal role in environmental conservation. Comprised of motivated volunteers and dedicated workers, they are committed to long-term, focused goals, such as forest restoration, which facilitates efficient progress (Spear, 2000). Importantly, NFPs are not driven by short-term profit maximization, making them cost-effective options for donations and government partnerships. Their localized approach provides contextually relevant solutions and an in-depth understanding of project areas and potential challenges. Being free from government or business influence, NFPs effectively integrate education and awareness campaigns into their mission, promoting sustainable practices and encouraging participation in environmental conservation. Despite their effectiveness, NFPs encounter challenges, particularly related to funding constraints and volunteer acquisition and retention. Funding limitations are common, necessitating collaboration with businesses and diversified funding sources. Many NFPs struggle to recruit volunteers due to challenges in promoting and advertising their initiatives. In the digital age, social media has emerged as an affordable and effective platform for organizations to reach a younger demographic.

### ***2.4. Environmental Education***

Evidence indicates that environmental education leads to increased pro-environmental engagement (Tzankozza, 2023). However, some individuals may feel demotivated to contribute due to the overwhelming complexity of environmental information (Wi & Chang, 2019). Simplifying this information and explaining personal behaviors that individuals can adopt, along with the potential consequences of inaction, make environmental stewardship more motivating and appealing (Verplanken & Wood, 2006).

### ***2.5. Evaluating Impact***

Evaluating the impact of NFPs like TFC is challenging, primarily due to the complexity of measuring well-being (Rojas, 2007), a key indicator of community impact. Surveys and

interviews are the primary methods for addressing this challenge, enabling researchers to inquire about respondents' feelings during certain activities. However, even these methods have limitations. Lengthy questionnaires often result in low response rates, particularly when organizations face limited funding. Additionally, shorter questionnaires may lack the depth that longer surveys provide. There is also a potential for bias in results due to differences in demographic openness to participating in surveys and surveyors' approach to specific demographics for data collection.

### **3. Methods**

#### ***3.1. Sample and Data Collection***

Our study sampled 67 TFC workers, 64 volunteers, and three paid workers. Within this sample, 14 participants were volunteers at a TFC tree planting, 40 participants were from the TFC Facebook page, ten were volunteers at the TFC nursery and three were paid workers at the nursery.

Our project was people-based, aiming to assess the impact of TFC on the individuals and communities it engages with. To understand how the public view TFC and how they can improve, we conducted qualitative data collection. We chose to survey participants using questionnaires and interviews as our main data collection method and applied this technique in three different ways to attempt to triangulate our data. This reduced bias which can result from using a single technique (Flick, 2004).

We designed our two questionnaires in two different formats; a format to be used for surveying volunteers in person, and a format which could be posted on the TFC Facebook page to allow higher response numbers. The questionnaire aimed at tree planting volunteers was conducted both online and in person, whereas the questionnaire for nursery volunteers was conducted in person only and in an interview style.

#### ***3.2. Tree Planting Volunteer Questionnaire***

Data for the tree planting volunteers was collected through questionnaires, both in person and online. Initial data collection took place during a TFC planting event at Southshore Spit



Reserve, where we administered a questionnaire to 14 volunteers to be completed independently. Subsequently, we refined our questionnaire based on their feedback and posted it on the TFC Facebook page, garnering 40 additional responses from tree planting volunteers. This questionnaire explored participants' perspectives on the benefits of trees, their introduction to TFC, issues and concerns with TFC, tree planting experience, emotional responses to tree planting and volunteering, and the knowledge gained about the environment through TFC.

### ***3.3. Nursery Volunteer and Worker Questionnaire***

We conducted interviews with both volunteers and staff at the TFC nursery. Ten nursery volunteers and three paid staff were interviewed. This involved a different questionnaire, incorporating open-ended questions to stimulate in-depth conversations and insights. We also recorded the interviews for further analysis. This questionnaire differed from the tree planting questionnaire, as it targeted individuals actively involved with TFC on a day-to-day basis. It delved into their satisfaction and sense of belonging at TFC, alterations in their environmental perspectives resulting from their involvement, and any observed improvements in their well-being. Participants were also asked to evaluate whether TFC was upholding its mantra and to provide suggestions for potential improvements.

### ***3.4. Data Analysis***

Analysis of our data involved the input of qualitative data gathered from our two questionnaires into Excel. Our interview recordings from the nursery interviews were analysed. We uploaded our data into Excel which was used to output statistical graphs. These graphs were compared with the reviewed literature to determine whether our results agreed with what had been previously published. A map was produced to analyse patterns of where people live, to assess whether there is any correlation between where individuals live and where planting events are held.

## **4. Results and Discussion**

This section presents the findings obtained through the in-person surveys conducted at the tree planting event and the tree nursery, along with information gathered from the online questionnaire.

### Map Demographics of the TFC Community

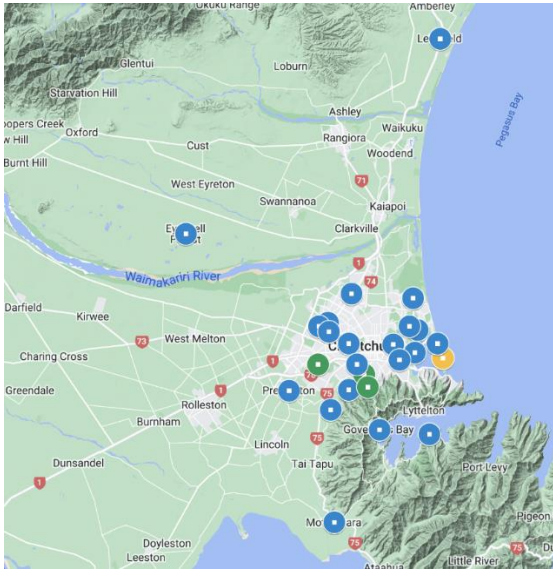


Figure 1: Map demographics of the TFC community. The concentration of people within an area is represented by the colours of the circles; blue = 1, green = 2-4, and yellow = 5+.

Figure 1 presents the distribution of the TFC sample community. There is no apparent correlation between the participants' origins and their likelihood of attending tree planting events. Due to the time constraints of this project, it is uncertain what the overall population distribution of the TFC community is. Therefore, it is not possible to conclude as to whether TFC impacts people differently on a spatial scale.

### TFC Workers' Enjoyment Level

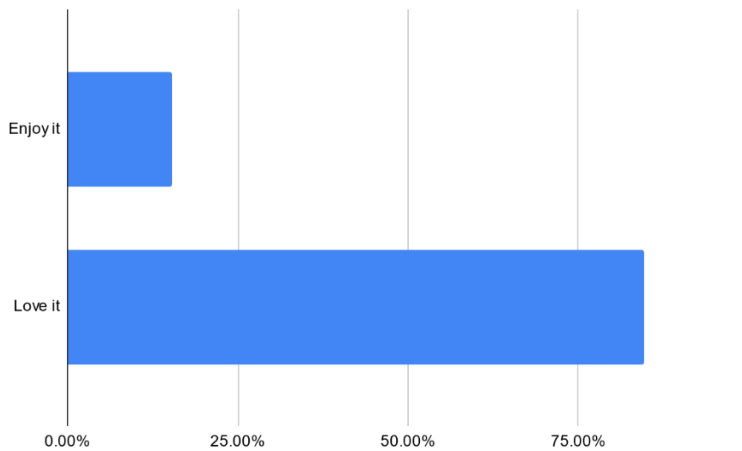


Figure 2: Shows the enjoyment level of TFC workers.

In Figure 2, the participant responses to the question: "Do you enjoy working at TFC?", are displayed. 84.6% of participants responded that they "love it", and 15.4% that they "enjoy it". Overall, 100% of respondents enjoy working at TFC. Although this data may not hold global significance, it holds importance for TFC as it provides them with a meaningful measure of their performance and impact.

*How Tree Planting Makes Participants Feel*

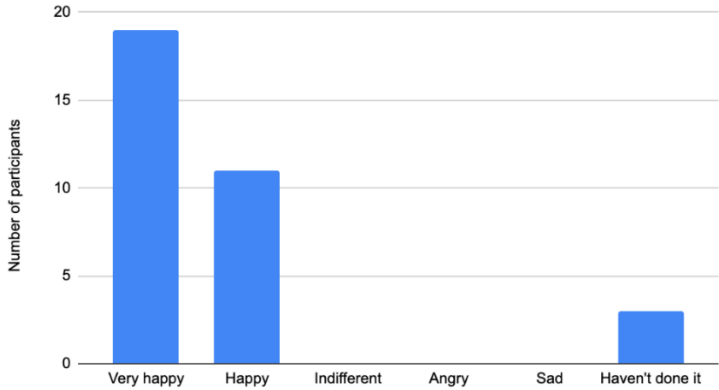


Figure 3: The relationship between participants and how tree planting makes them feel.

Of 33 respondents, 57.6% answered that tree planting makes them "very happy", as shown in Figure 3. 33.3% of respondents stated that it makes them "happy", and the final 9.1% had not participated in tree planting.

*Is Tree Planting Rewarding for Participants*

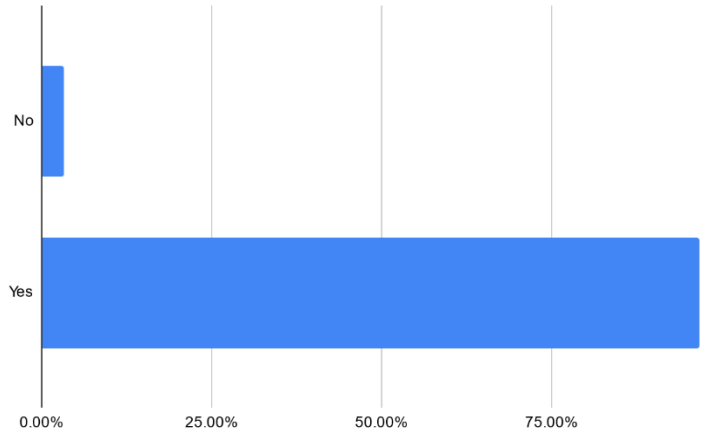


Figure 4: Participant response to the question; "Is tree planting a rewarding activity for you?"

#### *How Volunteering Makes Participants Feel*

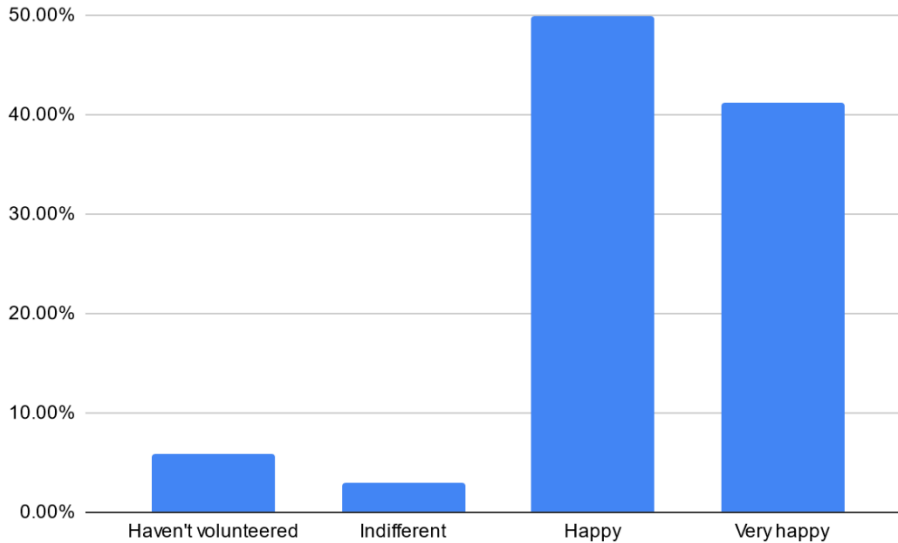


Figure 5: Participant response to the question; "How does volunteering make you feel?"

#### **4.1. Personal Well-being**

Figures 3 and 4 above display how participants feel as a direct result of tree planting. Both show significant positive trends, with respondents either finding tree planting "rewarding" or the activity increasing their happiness levels. Figure 5 displays the emotional effects felt by participants through volunteering and demonstrates positive trends, with 91.2% feeling either "happy" or "very happy". Whilst there may be some response bias making the statistics unvalidated, there is clear evidence of positive trends. O'Brien et al. (2010) investigated the effects of volunteering in environmental roles in terms of well-being. The paper argued that environmental volunteering, such as the activities undertaken by TFC, can impact well-being through different mechanisms. These mechanisms are exercise, community interaction and development of relationships, relaxation and mental calming, as well as meaningful contributions and mental stimulation (O'Brien et al., 2010). There is also extensive research to show the positive well-being effects experienced by environmental exposure (Thoits & Hewitt, 2001; Arnold et al., 2021). This information supports the sample data shown in Figures 2-5, providing a clear answer that TFC positively impacts the well-being of people involved.

#### ***4.2. Pro-Environmental Behaviours and Attitudes***

Our project aimed to assess the impact of tree planting and volunteering activities on individuals' behaviour and to gauge the contribution of TFC's educational programs to this change. Our hypothesis posited that engagement with TFC would positively influence individuals' behaviour and their environmental perspectives. Many participants reported gaining new knowledge through their involvement with TFC. This knowledge encompassed planting native flora in personal gardens, increasing plant survival rates, optimizing plant selection and placement, and enhancing biodiversity to attract birds and pollinators to their surroundings.

Notably, some participants shared their shifts in perspective: one stated that they had become 'more mindful of the environment and its protection,' while another expressed a newfound commitment to 'taking care of the trees.' Prior to joining TFC, only 23% of participants had experience in tree planting, usually limited to 1-5 instances. After joining, this figure increased to 54%, with some individuals participating more than ten times, as depicted in Figure 6 below. This substantial increase suggests that volunteering with trees is personally fulfilling, likely attributed to increased familiarity with the organization, a sense of community, and education about the value of native plants.

In line with our findings, a study by Zhang et al. (2023) discusses the implications of 'environmental group identification' and its role in promoting personal pro-environmental behaviour. The paper highlights three key mechanisms through which group identification enhances personal environmental motivation:

1. Exposure to other group members fosters learning and imitation, providing a reference framework. Our results reflect this point, with 92% of individuals reporting that they learned something new while working with TFC.
2. Involvement in an environmental group encourages and inspires action, as outlined by Zhang et al. (2023). This group action can further motivate personal initiatives.
3. A strong sense of belonging within a group leads to active engagement in group activities (Zhang et al., 2023).

The insights presented in this paper align with the findings of Zhang et al. (2023), underscoring the validity of our results. This data holds significant value for TFC as it highlights the positive effects of their educational and regeneration efforts.

### *Frequency of Tree Planting Involvement*

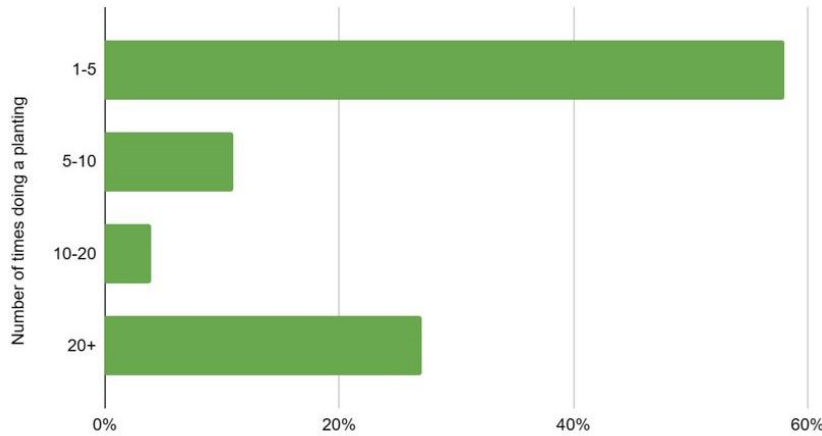


Figure 6: The frequency of participants' involvement in tree plantings.

In our Qualtrics questionnaire posted on the Facebook page, 87.5% of respondents mentioned participating in tree-planting events, either with or without TFC. Regarding the frequency of their participation, 57.7% reported being involved 1-5 times, while 26.9% mentioned participating 20 or more times. This highlights the strong sense of community within the organization and the regenerative impacts of their work.

### **4.3. Physical Community Impact**

We asked the question, 'Have you observed any changes in the tree population in Canterbury in recent years?' A significant 74% of respondents reported a positive increase in trees, particularly native trees, in locations such as 'Halswell Quarry,' 'Port Hills,' and 'wetland areas.' These locations align with areas where TFC has organized tree plantings, highlighting the tangible community impact of this organization. Figure 6 quantifies TFC's work and community involvement by displaying the number of plantings completed by participants. While not all plantings are organized by TFC, a substantial portion of participants have only planted through TFC. Only 23% of those surveyed had prior experience with tree plantings before joining the

group. By increasing the frequency of native plantings, biodiversity in these regions is on the rise, as supported by Curtis et al. (2019). Their study examined the effects of native planting in Canterbury's farmland regions on invertebrate species and found evidence of increased native spider populations, reduced rates of exotic slugs, and increased populations of ecosystem providers and pollinators (Curtis et al., 2019). In addition to the increase in biodiversity, native tree plantings are enhancing soil health by mitigating erosion (Hughes, 2016) and supporting nutrient cycles and contaminant removal (Dosskey et al., 2010; Mitter et al., 2021). This demonstrates another way in which TFC is bolstering the ecological capacity of community environments.

### *How Participants Discovered TFC*

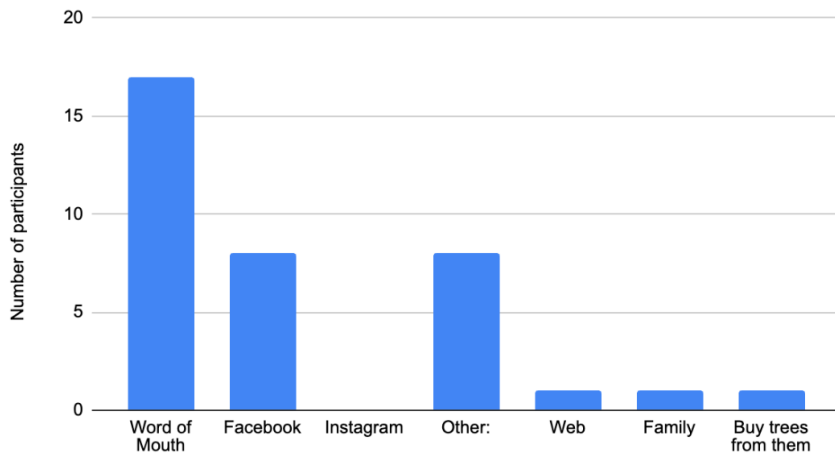


Figure 7: How participants heard about TFC.

Figure 7 reveals that 47.2% of participants learned about TFC through word of mouth. A substantial number also discovered TFC through Facebook and 'other' sources, including their website. Notably, none of the respondents cited Instagram as their source of information. A considerable demographic of young people may be overlooked due to the absence of social media engagement. This data holds significance for the organization, providing insights into the sources of their volunteers and areas where their advertising efforts may need improvement.

### *Was TFC the Best Organisation Participants Planted for?*

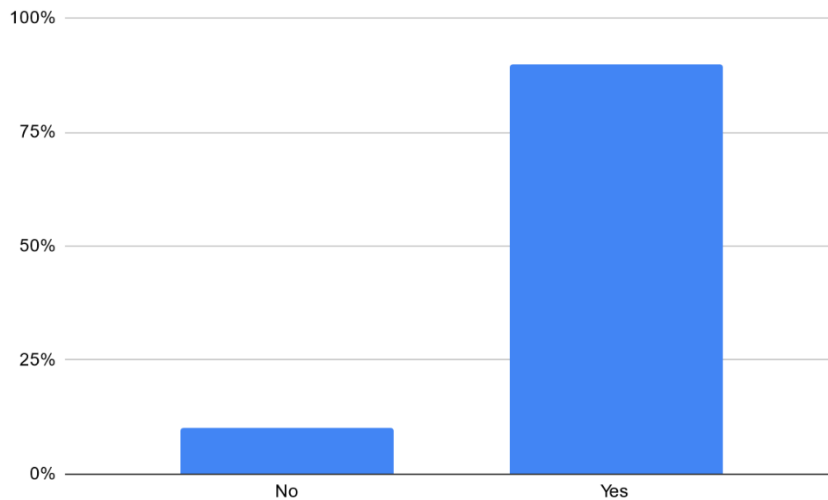


Figure 8: Participant response to the question; "Is TFC the best organisation you have planted for?"

Figure 8 highlights that an impressive 90% of respondents regard TFC as the best organization they have planted for. Participants praised TFC for being 'well organized with good communication,' providing necessary equipment, and offering clear demonstrations of planting requirements. They also commended TFC for their commitment, authenticity, and effective advance advertising. Moreover, 92% of respondents believe that TFC effectively embodies its mantra, 'Employ, educate, regenerate.' They cited examples of collaboration with schools and inclusivity for individuals with disabilities. Such engagement efforts have been shown to boost volunteer participation (Ilyas et al., 2020), indicating TFC's success in engaging and retaining their community. However, it's important to acknowledge that this overwhelmingly positive data may be influenced by response bias, raising questions about the figures' validity and reliability.



### *How Long Participants Have Worked at TFC*

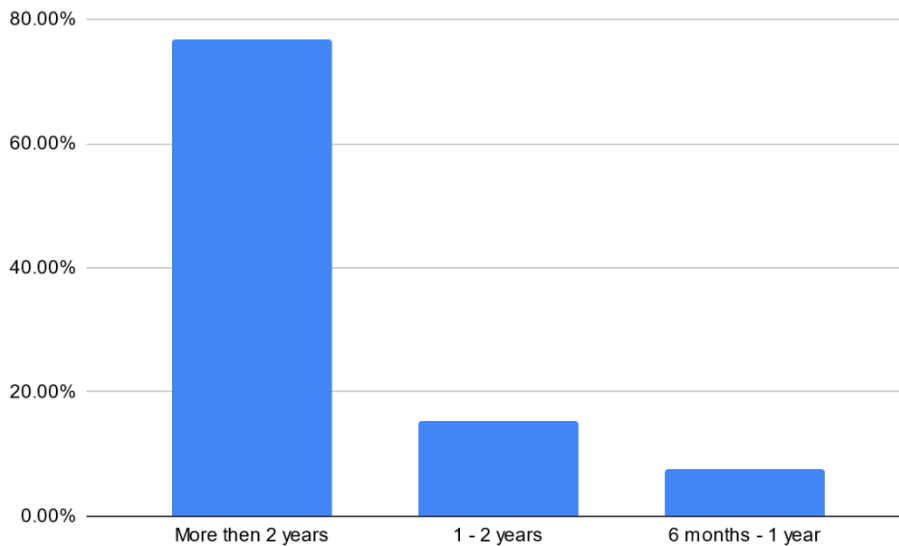


Figure 9: The length of time respondents have worked at the TFC nursery.

#### ***4.4. The Importance of NFPs***

We aimed to understand the role of NFPs and to address the significance of TFC for individuals. Survey respondents highlighted that NFPs provide a platform for communities to engage in environmental conservation efforts and respondents specifically noted that TFC are a very community-minded organisation as well.

TFC has had a significant impact on the people it works with, and the community recognises it. There is a clear commitment to educate less informed people about native plants and to give individuals with disabilities and impairments a sense of purpose. The results gathered align with our hypothesis, showing how TFC have a positive effect on the people and communities surrounding them; by engaging with communities and providing opportunities, they positively impact personal well-being. Also, through tree planting activities, TFC promotes pro-environmental behaviour whilst simultaneously upkeeping and increasing the health and biodiversity of local environments.

Overall, it is clear to see that TFC impacts the people and communities around them significantly. Whilst the trends are all very positive, there is some room for improvement. A lot

of the improvements that volunteers and staff recommended were based on a lack of resources and time, such as planting more trees and having more people on tasks. However, one person acknowledged that they are "too busy and without enough resources." More general feedback suggested that TFC lacks the necessary plans for a long-term sustainable business model. Another idea was to arrange earlier planting start times and longer sessions. Some individuals suggested that TFC could implement a buddy system to encourage participation in tree plantings for those who do not have anyone to go with and do not want to attend alone. These results and collected responses are significant to the community partner, as they give insight into what changes would be most effective for sustainable future development.

#### ***4.5. Marketing Strategies***

To target the 18-30 age range, TFC should consider putting more effort into social media marketing strategies to ensure their continued success. Social media outreach increasingly has implications for the growth of small NFPs with the shift of communication methods (Nolan, 2018). NFPs should understand the importance of effective communication strategies in order to continue growing their support into the future (Nolan, 2018). As modes of communication have been shifting, the skills of effective social media use are important to garner especially for small NFPs as it is an extremely cost-effective marketing strategy (Kirtiř & Karahan, 2011). An effective method to evaluate social media through is "audience, the content of the messages, and the vehicle of delivery" (Williamson, 2009). To evaluate whether your content matches the target audience, evaluate trends in terms of what has previously had the most interaction and to evaluate whether the delivery method being used is the most effective for the circumstance (Nolan, 2018). An effective way for TFC to improve their social media engagement would be to put a plan in place and set goals for how frequently they are going to post to increase their engagement. It is also important to use social media to enhance what they are already doing and use it to provide updates to the public on projects they are working on.

#### ***4.6. Limitations of the Study***

This study, aimed at benefiting TFC, faces certain limitations that should be acknowledged. Firstly, the study's relatively small scale limits the breadth of insights. With a small sample size, the findings may not fully represent the diverse experiences within the TFC community.

Secondly, in-person surveys were used, introducing potential bias due to surveyor proximity and perceptions of friendliness. This could affect the representativeness of the responses.

Additionally, there were missed opportunities for data collection. More extensive survey efforts, timely distribution, and engagement across various events could have improved the dataset. Our study primarily relied on surveys, missing out on the potential richness of data from methods like focus groups and observational data. Lastly, this was our first time doing a survey, and we have since learned lessons for future improvements, such as better survey design and more proactive data collection.

While the study offers valuable insights for TFC, its limitations, including size, bias, missed opportunities, and methodological scope, should be considered when interpreting the results. Future research should build upon these findings, aiming to address these limitations for a more comprehensive understanding.

#### ***4.7. Suggestions for Further Research***

To guide TFC into the future, the recommendations emphasize focusing research and development efforts on key areas. Firstly, it is advisable to conduct research into effective strategies for advertising their charity, particularly targeting the 18-30 age demographic, enabling further growth and revitalization. Recognizing Instagram as an underutilized social media tool, TFC should prioritize its presence on this platform, while simultaneously researching how other NFPs advertise and expand. The central recommendation involves conducting a comprehensive, long-term impact assessment. This assessment should involve an in-depth study of environmental impacts, with specific planting sites compared to control trials, providing empirical evidence of their ecological contributions. Furthermore, by extending the assessment over time, TFC can quantify the effectiveness of various educational efforts in promoting pro-environmental behaviour, underpinning the value of their initiatives.

### **5. Conclusion**

In conclusion, it is evident that TFC is doing an excellent job at following its mantra. They have proven themselves as educators, kind employers, and an organization that is regenerating Canterbury one tree at a time. We look forward to seeing them grow well into the future and

hope that our recommendations will be taken into consideration as we see them having a positive outcome in their business.

### **Acknowledgements**

We would like to acknowledge those that assisted us with our project along the way. Ritodhi our supervisor, has offered us his knowledge and guidance and has been a huge asset to our work. Simon Kingham for giving us the opportunity to work in the community. We would also like to acknowledge our amazing community partner Steve Bush as well as all our lovely respondents.

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